

# New records of *Dipsas welborni* Arteaga & Batista, 2023, *Gelanesaurus flavogularis* (Altamirano-Benavides, Zaher, Lobo, Grazziotin, Sales-Nunes & Rodrigues, 2013), and *Synophis insulomontanus* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015 in the Cordillera de Colán, Peru

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**Abstract.** A herpetological survey during recent expeditions to the foothills of the Cordillera de Colán in the Amazonas region of Peru resulted in new records and extensions of the geographical distribution of three poorly known species of reptiles: *Dipsas welborni* (family Colubridae), *Gelanesaurus flavogularis* (family Gymnophthalmidae), and *Synophis insulomontanus* (family Colubridae).

**Key words.** Amazon region, Andes, range extensions, reptiles, Squamata

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## INTRODUCTION

The Cordillera de Colán is a mountain ridge of moderate elevation in the Andes (<3700 m a.s.l.). This cordillera is isolated from the main Andes mountain chain by the Chiriaco and Utcubamba rivers, which flow northward into the upper Marañón River in northern Peru (Duellman and Pramuk 1999). Previous herpetological research and exploration in the Cordillera de Colán have yielded the discovery of many new species of amphibians, such as: *Gastrotheca abdita* Duellman, 1987, *Hyloxalus spilotogaster* (Duellman, 2004), *Pristimantis avicuporum* (Duellman & Pramuk, 1999), *P. atrabracus* (Duellman & Pramuk, 1999), *P. serendipitus* (Duellman & Pramuk, 1999), *P. cuneirostris* (Duellman & Pramuk, 1999), *P. metabates* (Duellman & Pramuk, 1999), *Telmatobius colanensis* Wiens, 1993, *Colostethus poecilonotus* Rivero, 1991, *Hyloscirtus diabolus* Rivera-Correa, García-Burneo, & Grant, 2016, *Gastrotheca gemma* Venegas, García-Ayachi, Echevarría, Paluh, Chávez-Arribasplata, Marchelie & Catenazzi, 2021, *Lynchiwayneholomona* Venegas, García-Ayachi, Ormeño, Bullard, Catenazzi & Motta, 2021, *Oreobates colanensis* Venegas, García-Ayachi, Ormeño, Bullard, Catenazzi & Motta, 2021, and *Pristimantis paulpittmani* Venegas, García-Ayachi & Catenazzi, 2021. In contrast, the reptile fauna of this semi-isolated mountain ridge remains poorly known, and only three new lizard species *Stenocercus dracopennatus* Venegas, García-Ayachi, Chávez-Arribasplata, Chávez, Wong & García-Bravo, 2020, *Enyalioides cyanocephalus* Venegas, García-Ayachi, Chávez-Arribasplata, Marchelie, Bullard, Quispe, Valencia, Odar & Torres-Carvajal, 2024, and *E. dickinsoni* Venegas, García-Ayachi, Chávez-Arribasplata, Marchelie, Bullard, Quispe, Valencia, Odar & Torres-Carvajal, 2024 have been described in recent years.

To contribute to the knowledge of reptile diversity of the Cordillera de Colán, we report new records and range extensions for *Dipsas welborni* Arteaga & Batista, 2023, *Gelanesaurus flavogularis* (Altamirano-Benavides, Zaher, Lobo, Grazziotin, Sales-Nunes & Rodrigues, 2013), and *Synophis insulomontanus* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015.



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## METHODS

Reptiles were captured manually using the complete species inventory technique (Scott 1994), which consisted of slow nocturnal walks (mainly carried out from 20:00 h to 02:00 h) along trails and through the forest. We collected voucher specimens and recorded their geographic coordinates and elevation data with a Garmin GPS receiver using the WGS84 datum. Specimens were euthanized with an overdose of T61 (Intervet), fixed in 10% formalin for 48 h, and permanently stored in 70% ethanol. Voucher specimens were deposited at the herpetological collection of the Centro de Ornitología y Biodiversidad (**CORBIDI**) in Lima, Peru. Sex of specimens was determined by noting the presence of everted hemipenis in the field or by specimen dissection in the laboratory. Specimens were collected under permits granted by the Servicio Nacional Forestal y de Fauna Silvestre, Resolución de Dirección General N° D000010-2021-MIDAGRI-SERFOR-DGGSPFFS and the Reserva Comunal Chayu Nain, Resolución Jefatural N° 004-2023-SERNANP-RCCHN-J.

## RESULTS

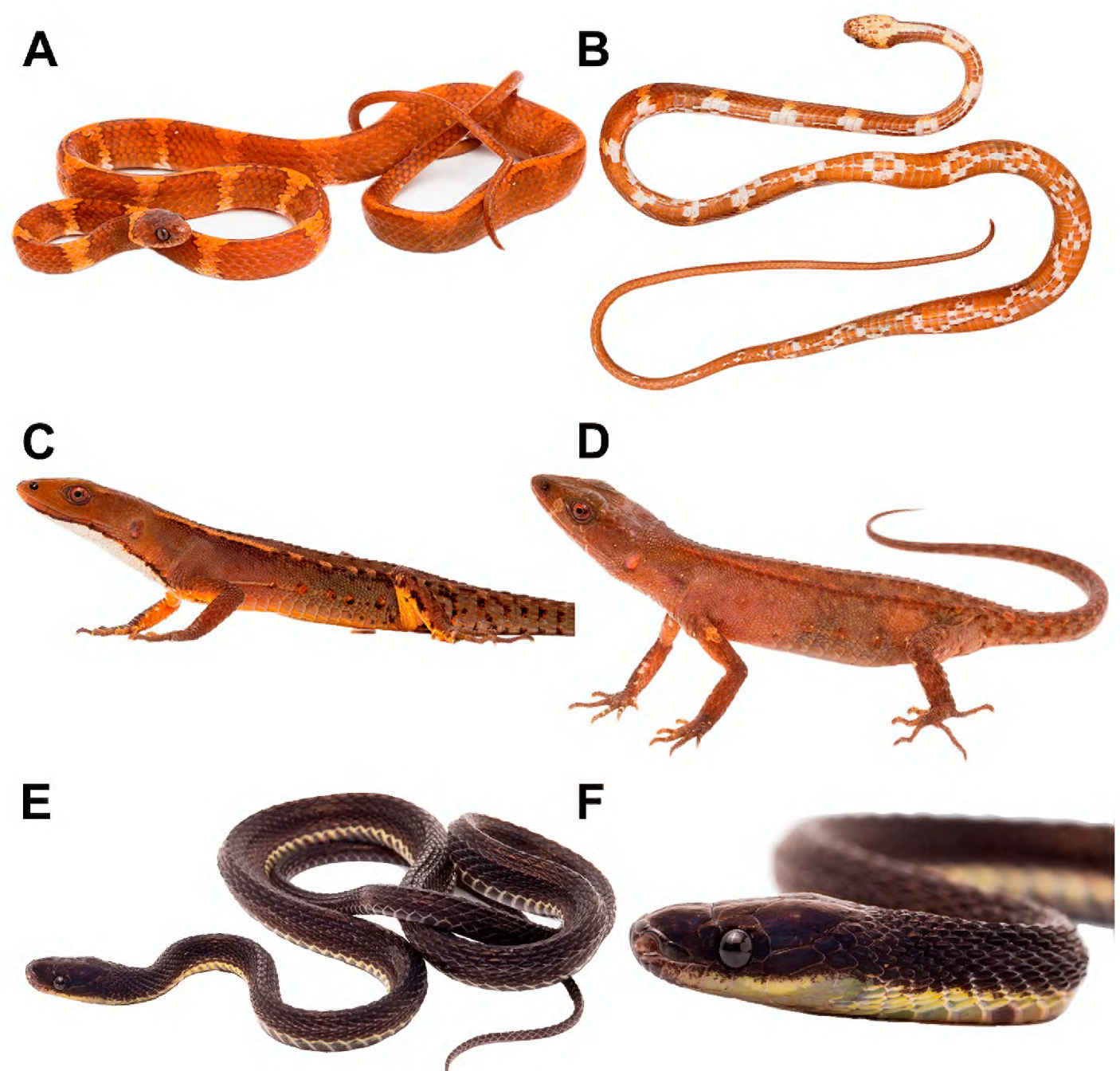
Family Colubridae

### *Dipsas welborni* Arteaga & Batista, 2023

**New record.** PERU – DEPARTAMENTO AMAZONAS • Provincia Bagua, Distrito Imaza, Alto Wawas native community; 05°23'12.09"S, 078°17'10.69"W; 1,410 m alt.; 09–10.VI.2023; Luis A. García-Ayachi, Santiago Bullard, Juan D. Valencia, Jasmín Odar, Eduardo Quispe leg.; specimens were found moving among the leaves or the branches of shrubs in a primary forest; 3♀, CORBIDI 25435, 25437, 25474. Figure 1A, B.

**Identification.** We identified the collected specimen following the diagnostic characters of *D. welborni* according to Arteaga and Batista (2023). The three voucher specimens reported in this study were distinct from other *Dipsas* Laurenti, 1768 species from Peru in having dorsal scales arranged in 13/13/13 rows, a loreal scale in contact with the orbit, and the dorsum of the head vermiculated. Moreover, our specimens also differ from the most similar species, *D. vermiculata* Peters, 1960, which is currently known from Ecuador and Colombia (Arteaga and Batista 2023), in having (character states of *D. vermiculata* in parentheses): two

**Figure 1.** Photographs of voucher specimens in life. **A, B.** Dorsal and ventral view of female *Dipsas welborni* CORBIDI 25435. **C.** Lateral view of male *Gelanesaurus flavogularis* CORBIDI 25496. **D.** Lateral view of female *Gelanesaurus flavogularis* CORBIDI 25444. **E, F.** Dorsal and head view of male *Synophis insulomontanus* CORBIDI 24867. Photographs by E. Quispe.



prefrontal scales (vs. prefrontal fused into a single scale), 109–121 subcaudals in males (vs. 103–113), and a white background ventral coloration (vs. yellow or yellowish white).

***Synophis insulomontanus* Torres-Carvajal, Echevarría, Venegas, Chávez & Camper, 2015**

**New record.** PERU – DEPARTAMENTO AMAZONAS • Provincia Bongara, Distrito Yambrasbamba, ACP Pampa del Burro; 05°37'21.60"S, 077°58'14.54"W; 1,590 m alt.; 16.III.2023; Pablo J. Venegas, Luis A. García-Ayachi, Santiago Bullard, Eduardo Quispe, Juan D. Valencia leg.; 1 adult male was found on the ground, amongst the leaf litter of a secondary forest that was in the regeneration process after being used for coffee plantations some years prior; 1 ♂, CORBIDI 24867. Figure 1E, F.

**Identification.** We identified the collected specimen following the diagnostic characters of *S. insulomontanus* according to Torres-Carvajal et al. (2015). The single male voucher specimen reported here was easily identified as *S. insulomontanus* by the following: (1) 19 longitudinal rows of dorsal scales at midbody; (2) strongly keeled dorsal scales except for the first row, which is keeled to a lesser extent; (3) 143 ventral scales (151–152 ventrals reported in males); (4) 105 subcaudal scales (108–109 subcaudals reported in males). In addition, our single specimen had a semicapitate, bilobed hemipenis with a large lateral spine at the base of the hemipenial body, as described for the holotype of *S. insulomontanus* by Torres-Carvajal et al. (2015).

Family Gymnophthalmidae

***Gelanesaurus flavogularis* (Altamirano-Benavides, Zaher, Lobo, Grazziotin, Sales-Nunes & Rodrigues, 2013)**

**New record.** PERU – DEPARTAMENTO AMAZONAS • Provincia Bagua, Distrito Imaza, Alto Wawas native community; 05°23'23.58"S, 078°17'00.92"W; 1,540 m alt.; 09–10.VI.2023; Luis A. García-Ayachi, Santiago Bullard, Juan D. Valencia, Jasmín Odar, Eduardo Quispe leg.; specimens were found sleeping on leaves of shrubs in a primary forest; 3 ♀, CORBIDI 25444, 25468, 25495, 1 ♂, CORBIDI 25496. Figure 1C, D.

**Identification.** We identified the collected specimens following the diagnostic characters of *G. flavogularis* according to Altamirano et al. (2013). The voucher specimens reported here were easily distinguished from all other gymnophthalmid lizards from Amazonian Peru and Ecuador, including *G. cochranæ* (Burt & Burt, 1931), in having the following characters: (1) regular longitudinal rows of dorsal tubercles in a series of single enlarged and strongly keeled tubercles; (2) absence of enlarged tubercles on sides of neck and body; (3) a brown spot around nostril; and (4) males with a white conspicuous patch in the gular region (Fig. 1C).

## DISCUSSION

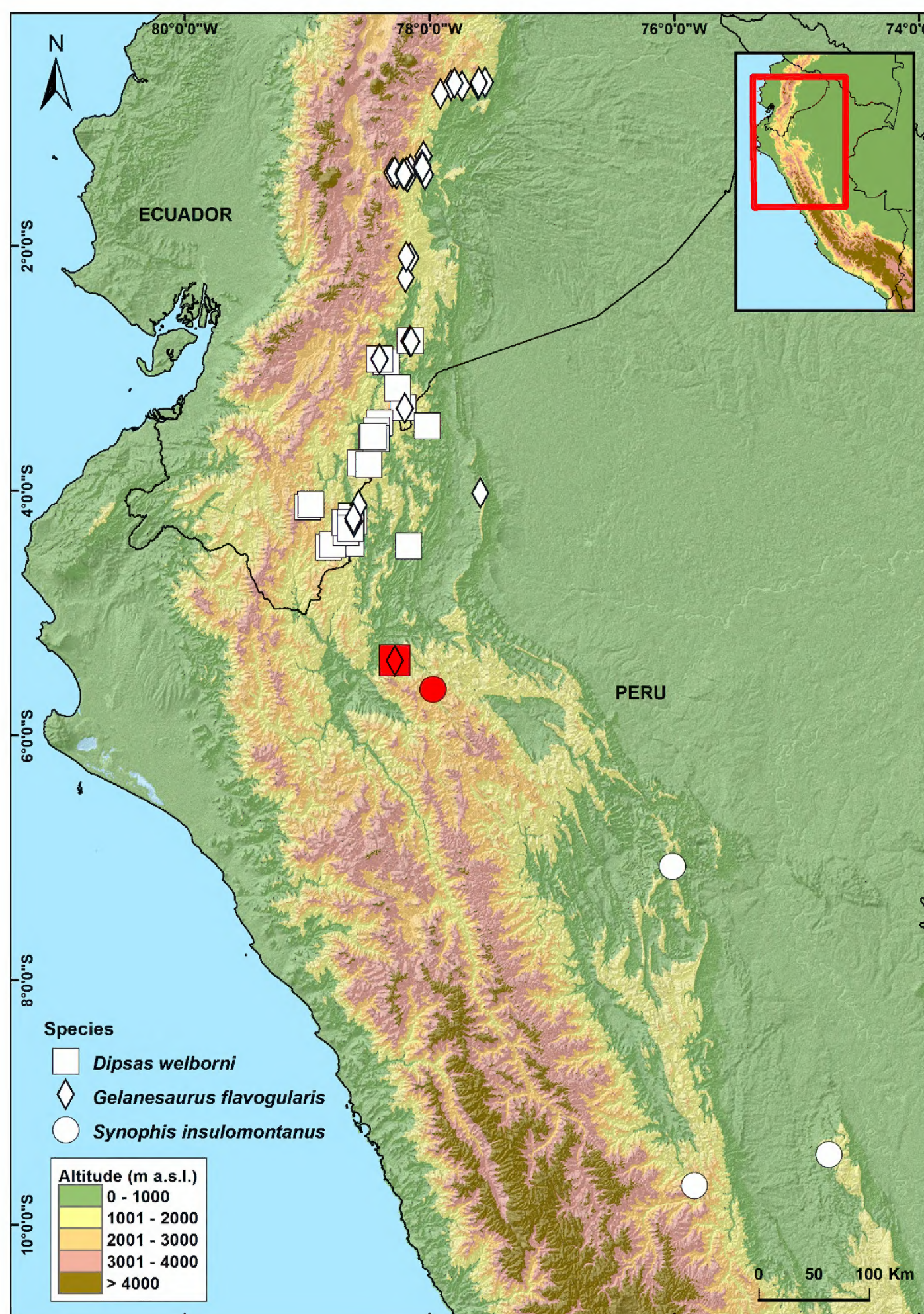
*Dispsas welborni* is a recently described species. Arteaga and Batista (2023) reported it from 26 localities distributed along the Cordillera del Cóndor in southeastern Ecuador and northern Peru (Amazonas department), at elevations between 853–1843 m a.s.l. However, one of the records at the Amazonas department is above 245 m a.s.l. (see supplementary 2 of Arteaga and Batista 2023). We observed the species at 1410 m a.s.l. along humid montane forest in the northern slopes of Cordillera de Colán. The new locality for *D. welborni* lies near Reserva Comunal Chayu Nain, a natural reserve protected by Awajum native communities. Our record extends this species' geographical range by 103.9 km in a straight line southwest from the previously known southernmost locality in Etsekeatai Entse, departamento Amazonas, Peru (Figure 2, see Supplementary file 1 for localities).

*Gelanesaurus flavogularis* was first described in 2013 from three localities in the Cordillera Guacamayos, Ecuador, at elevations between 1140 and 1800 m a.s.l. (Altamirano et al. 2013). However, the species was misidentified by Catenazzi and Venegas (2012) as *G. cochranæ* during a rapid biological and social inventory in Cerro de Kampankis, Peru, at 1340 m a.s.l. Recently, Fang et al. (2020) extended the geographical distribution of the species to northern Ecuador. Our record was at 1540 m a.s.l., near the Reserva Comunal Chayu Nain. This new locality extends the geographic range to the southeast by 131.4 km in a straight line from the previously known southernmost locality in Cordillera del Condor, Miaz Alto, Zamora Chinchipe, Ecuador (Figure 2, see Supplementary file 1 for localities).

*Synophis insulomontanus* was previously known only from three localities reported by Torres-Carvajal et al. (2015) when the species was named. These localities have an altitudinal range of 1122–1507 m a.s.l. We observed the species at 1590 m a.s.l. in the Área de Conservación Privada Pampa del Burro, a private natural protected area owned by the village of La Perla del Imaza. This new locality extends the geographic range to the northwest by 269 km in a straight line from the previously known northernmost locality, Puesto de Control 16 at Parque Nacional Cordillera Azul (Figure 2, see Supplementary 1 for localities).

We noted little variation in ventral and subcaudal scales count between our male specimen (CORBIDI 24867) and the two males of the type series of *S. insulomontanus* (143 ventrals versus 151–152 and 105

**Figure 2.** Geographic range of *Dipsas welborni*, *Gelanesaurus flavogularis*, and *Synophis insulomontanus*. Red symbols indicate the new locality records.



subcaudals versus 108–109). The hemipeneal morphology of our specimen is identical to the hemipeneal description by Torres-Carvajal et al. (2015). We consider the ventral and subcaudal variation as not diagnostic due to the small number of male specimens (only two) on which the original description of *S. insulomontanus* was based. However, although the number of subcaudals of our specimens overlap with the *S. zamora*, a species from the extreme southern Ecuador in Zamora and Morona-Santiago provinces, which can be distinguished from our specimen of *S. insulomontanus* by the hemipeneal morphology (enlarged spine on right side of hemipeneal base in sulcate view in CORBIDI 24867 and left side in *S. zamora* see Torres-Carvajal et al. (2015)).

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## ADDITIONAL INFORMATION

### Conflict of interest

The authors declare that no competing interests exist.

### Ethical statement

No ethical statement is reported.

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### Author contributions

Conceptualization: LAGA. Formal analysis: LAGA, JO, JDV. Funding acquisition: PJV. Investigation: LAGA, PJV. Methodology: LAGA, JO, JDV, SB, EQ. Resources: PJV, LAGA. Supervision: PJV, LAGA. Visualization: LAGA. Project administration: PJV, LAGA. Validation: PJV, LAGA. Writing – original draft: LAGA, JO, JDV. Writing – review and editing: LAGA, JO, JDV, SB, EQ, PJV.

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### Data availability

All data that support the findings of this study are available in the main text and in the Supplementary file.

**Supplementary file 1.** Previously known locality records of *Dipsas welborni*, *Gelanesaurus flavogularis*, and *Synophis insulomontanus*.

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